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November 26, 2001

Ms. Magalie Salas, Secretary
Federal Communications Commission
445 12th Street SW
Washington DC 20554

**Re: ET Docket No. 98-153 -- Revision of Part 15 of the Commission's Rules Regarding
Ultra-Wideband Transmission Systems
*Ex Parte Communication***

Dear Ms. Salas:

Pursuant to Section 1.1206(a)(1) of the Commission's Rules, on behalf of XtremeSpectrum, Inc., I am electronically filing this written ex parte communication in the above-referenced proceeding.*

On Friday, November 23, John McCorkle of XtremeSpectrum transmitted the attached materials to Michael J. Marcus of the Office of Engineering and Technology.

If there are any questions about this filing, please call me at the number above.

Respectfully submitted,

Mitchell Lazarus
Counsel for XtremeSpectrum, Inc.

* XtremeSpectrum, with 67 employees, conducts research in ultra-wideband communications systems as its sole business. XtremeSpectrum intends to become a ultra-wideband communications manufacturer once the Commission authorizes certification of such systems. XtremeSpectrum takes no position on ultra-wideband radar applications.

ARSR -- What it is Air Route Surveillance Radar



■ Performance Requirement

- 200 nm (370 km) for a 2.2 m² (3.4 dBm²) RCS airplane in clear air

■ Specifications

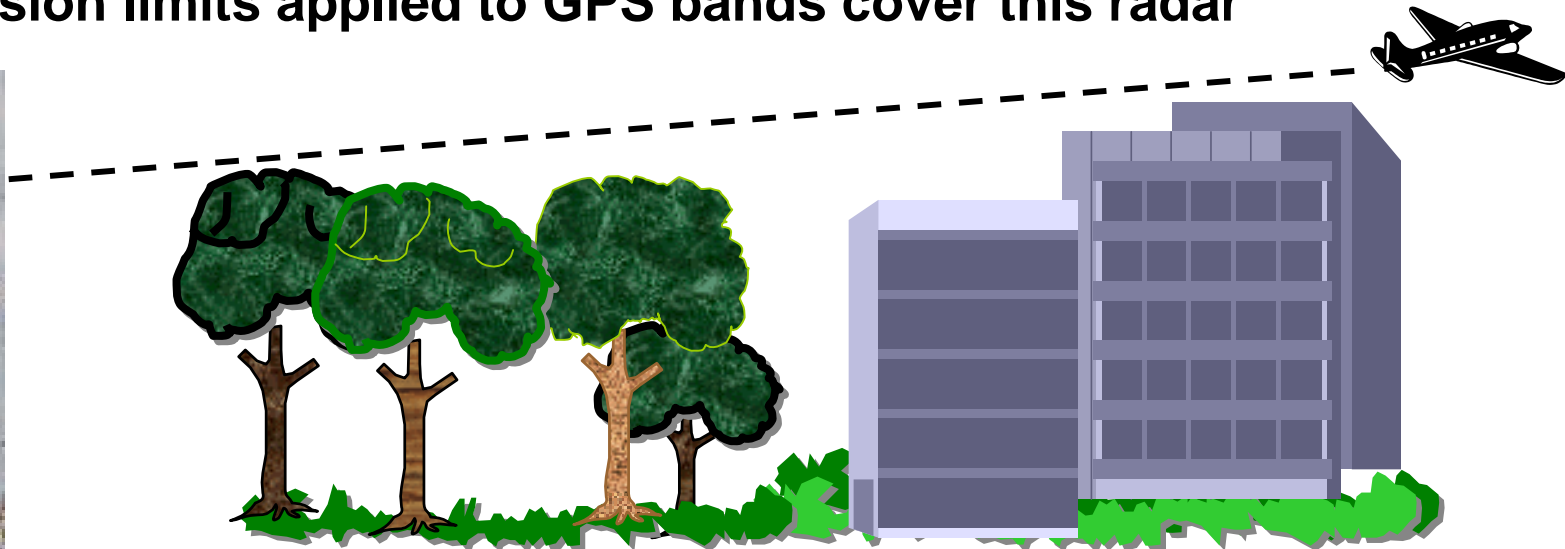
- Antenna
 - Maximum gain 41.8dBi
 - Nine vertically stacked beams with different gains
 - Beam-One 3 dB Beamwidth Vertical 2.0, Horizontal 1.4 Degrees

	ARSR-3	ARSR-4
Average Power	2.7 kW	2.5 kW
Peak Power	4.6 MW	93 kW
Peak EIRP	69.6 GW	1.4 GW
Pulse Width	2.2μs	59-89μs
Bandwidth	690 kHz	690 kHz
Noise Floor	-112 dBm	-112 dBm
200 V/m RadHaz Distance	7200 m	1065 m
Frequency	1215-1400 MHz	1215-1400 MHz
Rotation Rate	5 rpm	5 rpm

ARSR-3 & 4

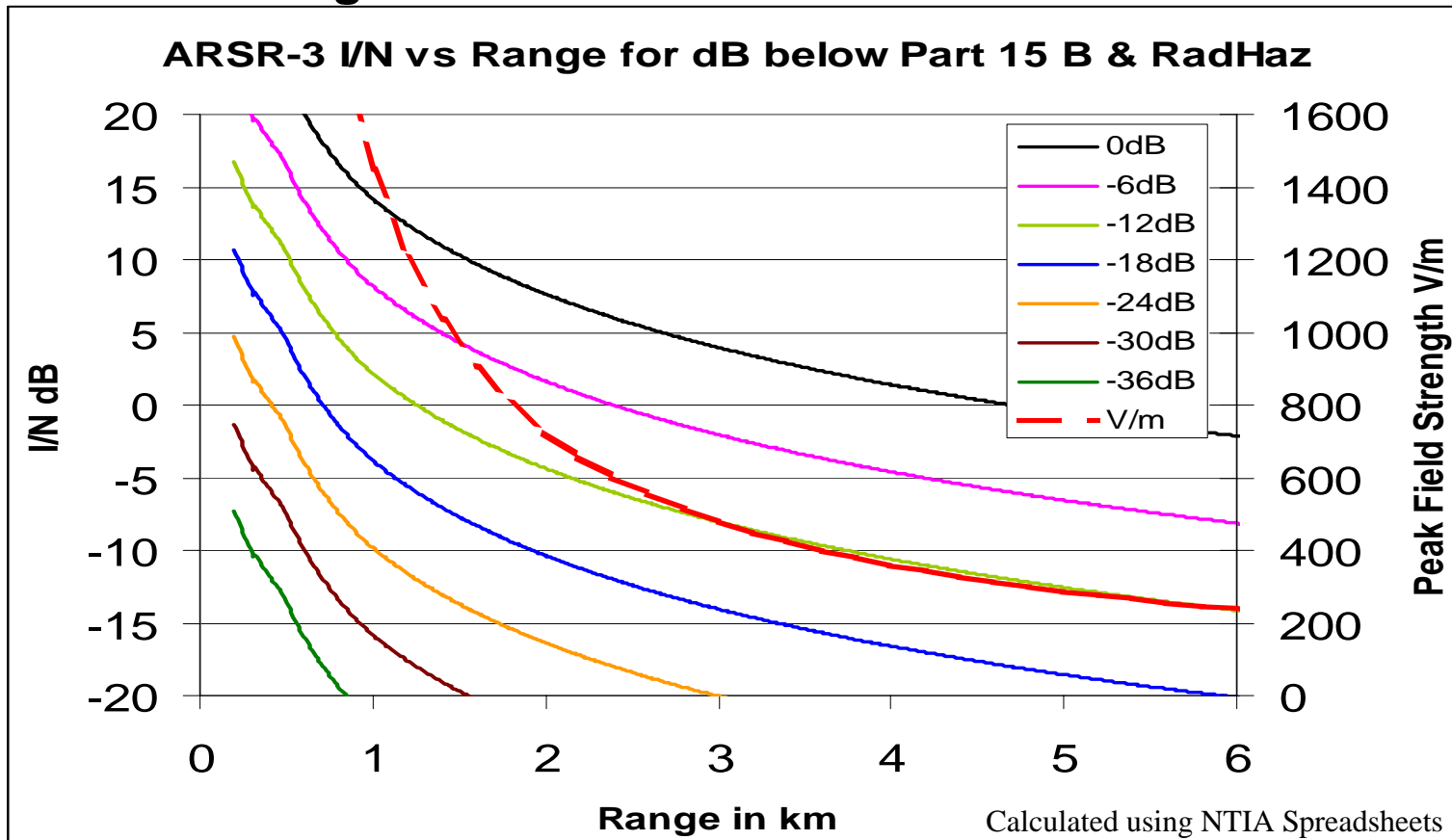
Air Route Surveillance Radars

- **These radars are limited by clutter, NOT their own receiver-noise**
 - The beam is aimed above buildings and other obstructions
 - The hypothetical 30m height UWB assumed by NTIA cannot occur in practice
 - A 30m tall building must be too close (480 m) for the peak antenna lobe to hit the roof
 - This range is too close (causes blockage, it is not safe, should not happen)
 - At closer ranges the main lobe hits into the building below the roof.
 - Siting is used to avoid radiation hazard and minimize clutter
- **The target signal strength is very high**
- **Any emission limits applied to GPS bands cover this radar**

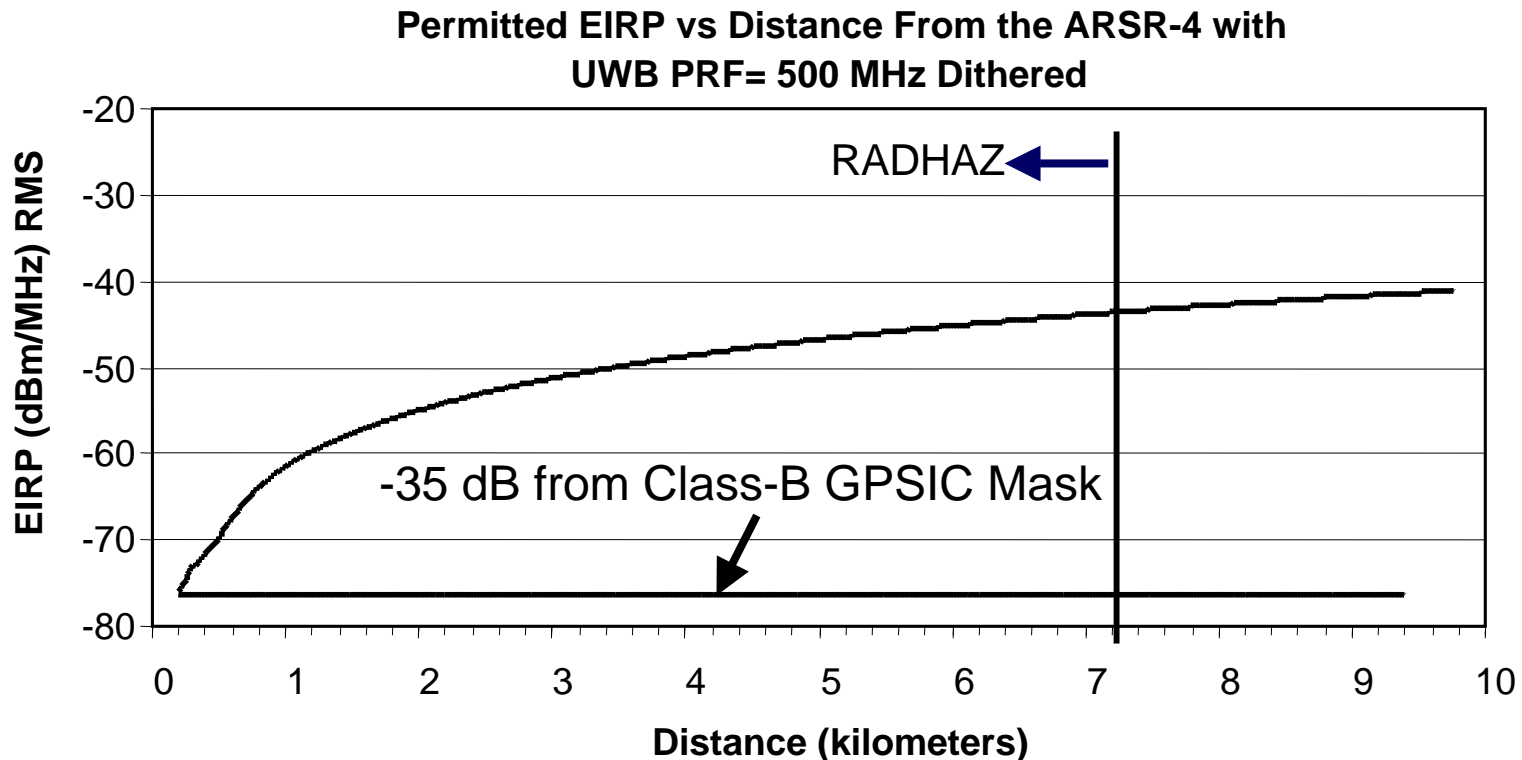


ARSR-3 Interference to Noise Ignoring Clutter

- **Field Strength at UWB location (Red) and I/N at Radar versus Range**



ARSR - 3 Interference versus Range UWB Elevated 30 Meters

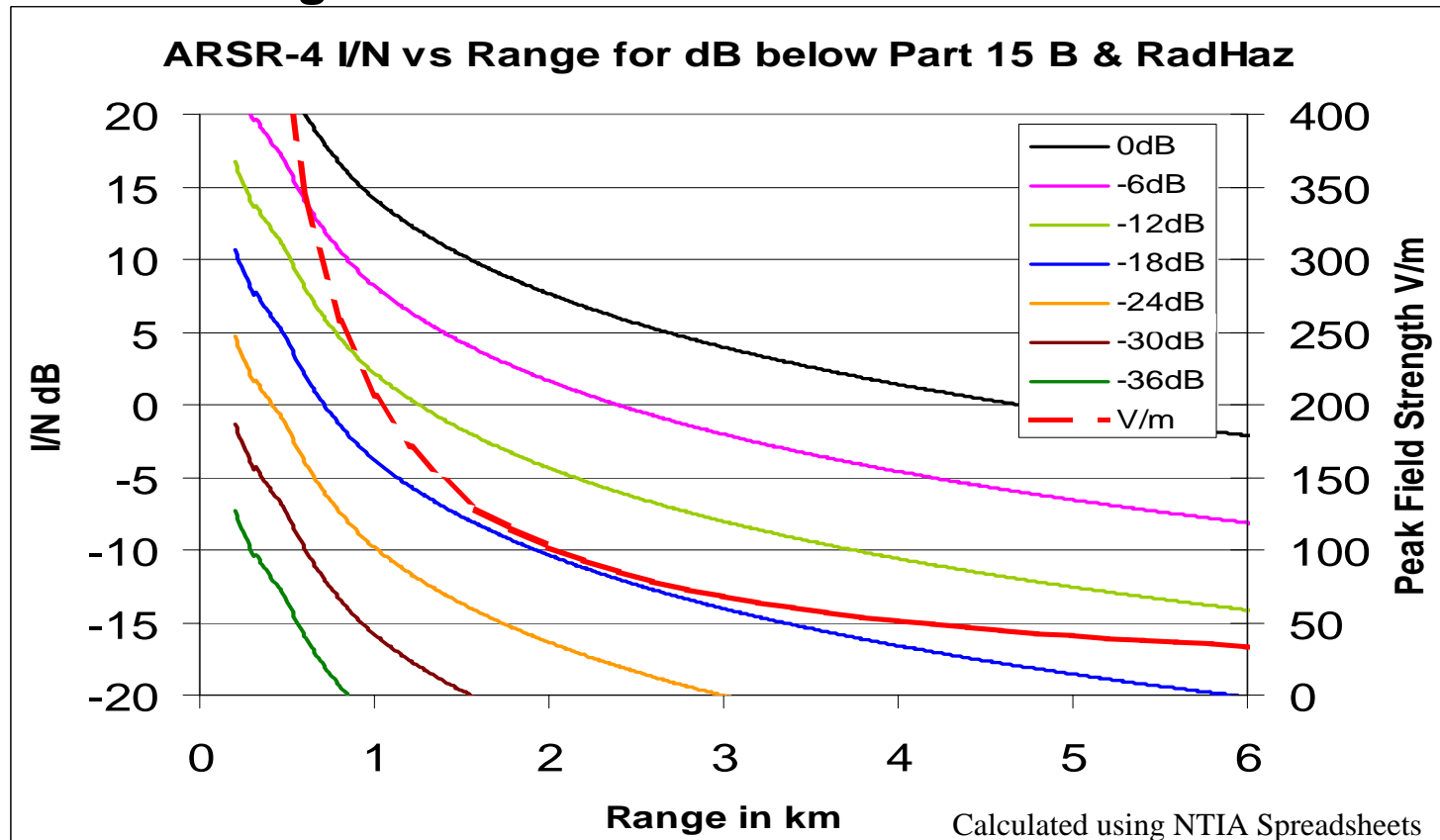


GPSIC's suggested limit (-35 dB) sets onset of interference at 200 meters

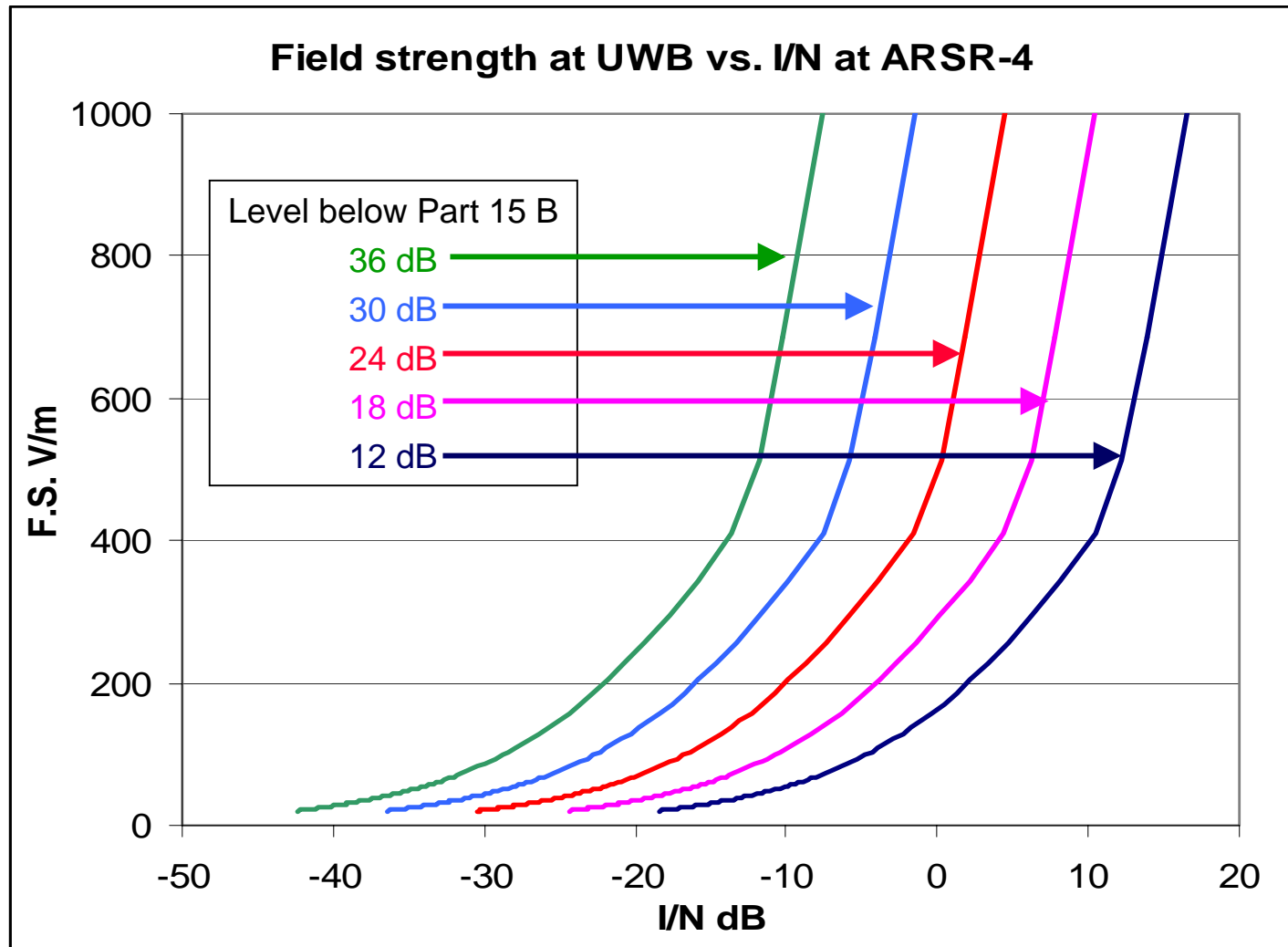
ARSR-3 radars operate with ground-level and elevated outdoor pedestrian UWB devices at the 7.2 km RadHaz range

ARSR-4 Interference to Noise Ignoring Clutter

- **Field Strength at UWB location (Red) and I/N at Radar versus Range**

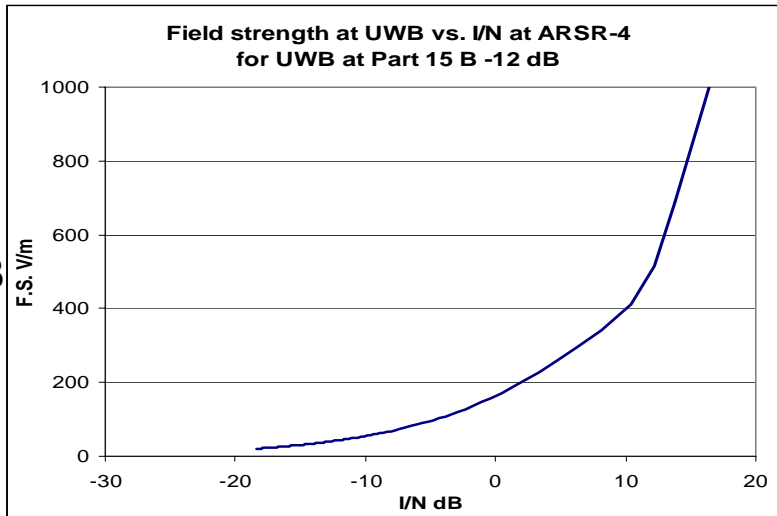


ARSR-4 Field Strength vs Interference/Noise Ignoring Clutter

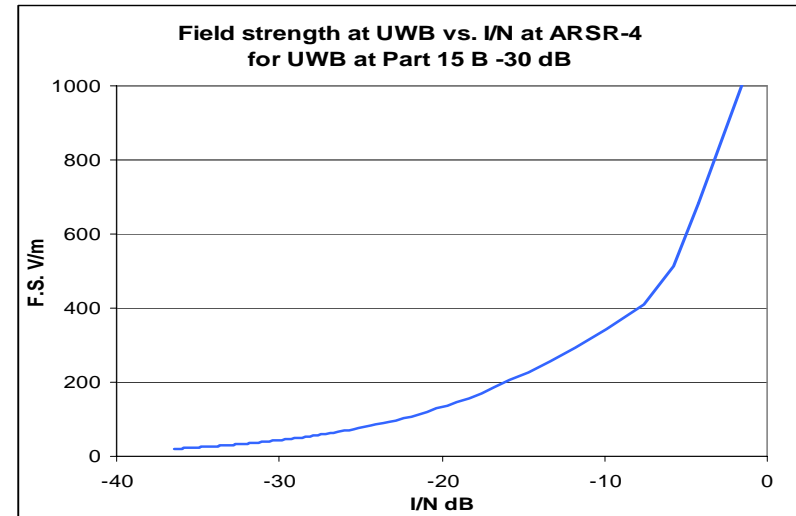


ARSR-4 Field Strength vs Interference/Noise Ignoring Clutter

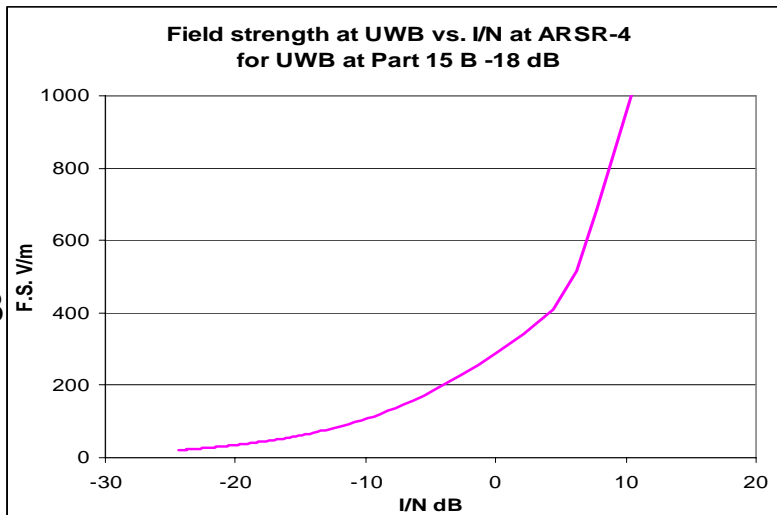
-12 dB



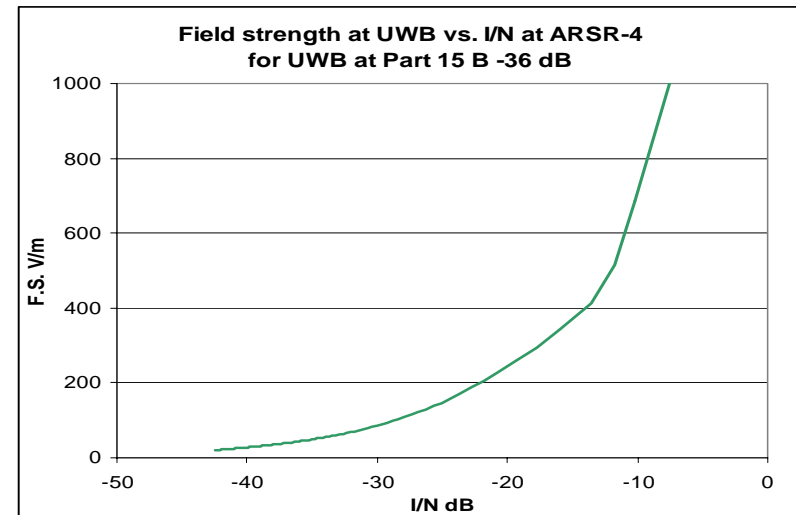
-30 dB



-18 dB



-36 dB



ARSR-4 NTIA Spreadsheet Calculations

To raise the noise figure by 1 dB



■ Using NTIA Spreadsheets

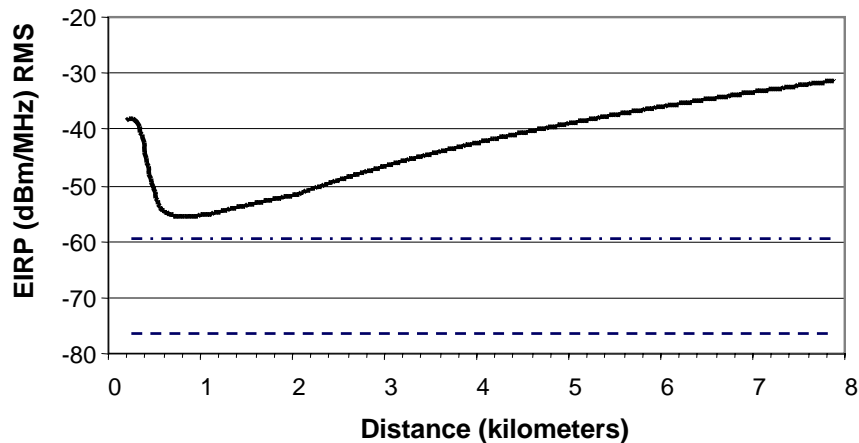
(Ignoring the SNR and just considering its own receiver-noise)

- A 2 m UWB cannot raise noise floor 1dB no matter how close
- A 30 m UWB must be closer than 1.25 km

■ But – the receiver noise floor is **NOT** the issue

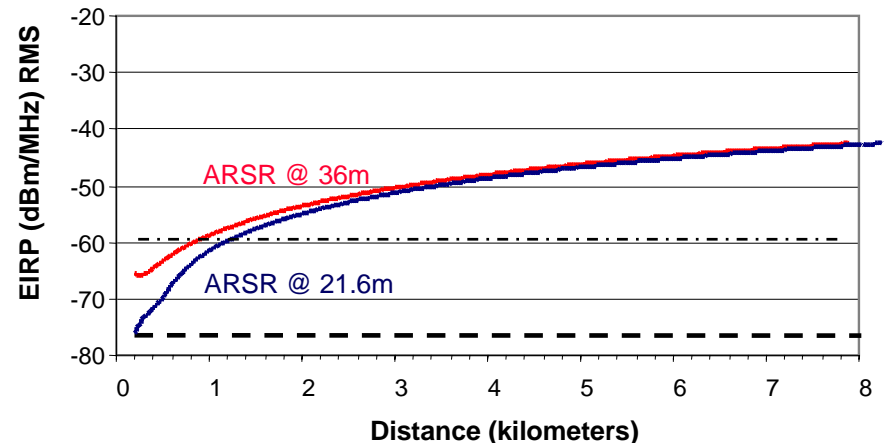
- The radiation at 1 km is 200 V/m
- Signal is huge

Permitted EIRP (for –6dB I/N) vs Distance From the ARSR-4
with UWB PRF= 500 MHz Dithered, UWB at 2m



— · — · XSI –18dB from Class-B limit

Permitted EIRP (for –6 dB I/N) vs Distance From the ARSR-4
with UWB PRF= 500 MHz Dithered, UWB at 30m



— — — GPSIC –35 dB from Class-B limit

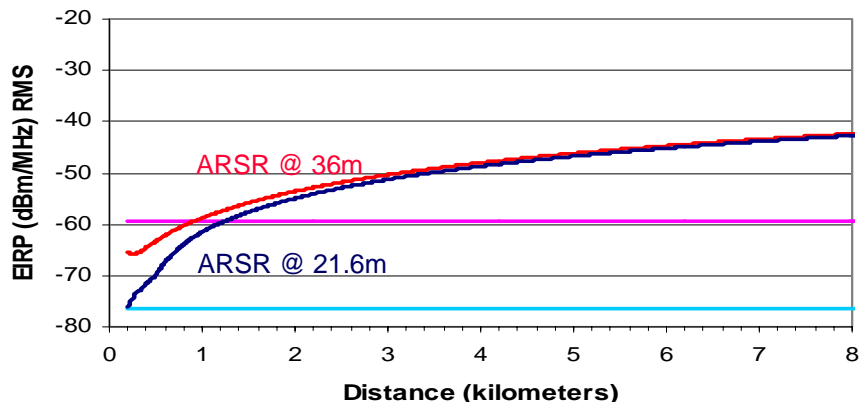
ARSR-4 Performance

The noise floor is NOT the issue



- Signal from a 2.2 m² RCS airplane 200 n mi away is huge
 - Over 10,000 times stronger (40 dB) than a -59.3 dBm/MHz UWB device at 30m height and 1.25 km away
 - Over 2,500 times stronger (34 dB) than a -53.3 dBm/MHz device proposed in the NPRM
 - Over 100 times stronger (22 dB) than a Class-B UWB device
 - The clutter is always stronger than the UWB device
- **The radar continues to perform its function**
- **There is NO harmful interference**

Permitted EIRP vs Distance From the ARSR-4 with
UWB PRF= 500 MHz Dithered, UWB at 30m



■ XSI -18dB mask ■ XSI GPS filter

Signal-to-Noise vs. Range

